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## Air Operating Permit Excess Emissions Report Form Part II

|                                  |                             |   |            |
|----------------------------------|-----------------------------|---|------------|
| Name of Facility                 | Shell, Puget Sound Refinery | Reported by   | Tim Figgie |
| Date of notification             | July 20, 2010               | Incident type:<br>breakdown/ upset/startup<br>or shutdown | Breakdown  |
| Start Date                       | July 20, 2010               | Start Time:   | 3:00 AM    |
| End Date                         | July 20, 2010               | End Time:   | 5:00 AM    |
| Process unit or system(s): Flare |                             |   |            |

### Incident Description

On July 19, 2010 at approximately 5:30 PM the DCU blowdown recovery compressor (15K100) shutdown due to mechanical problems. Operations attempted to restart the compressor but noticed a leak in the piping system that prevented immediate compressor restart. On July 20 at approximately 3 AM the DCU went into a coker blowdown cycle and, without the 15k100 recovery compressor, excess flaring occurred. FGR was operating at the time but the brief pressure spike resulted in break through of the seal pot. This resulted in 3 exceedances of the 1-hour average 1000-ppm SO<sub>2</sub> corrected to 7% excess O<sub>2</sub> limit. The cause of the 15k100 failure has been determined to be a malfunction of the compressor second stage knock-out drum level instrument (15LC308). The level indicator falsely read low while the liquid level increased. The compressor tripped on high liquid levels.

Recommendations to avoid a reoccurrence of excess flaring while K100 is down for repairs are:

1. DCU to notify FGR Console operator prior to the venting to the flare process is to begin for blowdown, 15 minutes prior.
2. FGR console operator is to begin cycling up to 4 compressors and monitor the kickback valve and Flare line pressures.
3. Once FGR compressors are cycled up, DCU may begin to slowly open up to the flare for venting during the blowdown drum process.
4. Operations Console operators should all monitor the following tags to help keep the venting under control: 19SO2FLAMEDRYPCT7, 15FI424.PV, 19FGRCMPRCOUNT and 19PC281.PV (These tags will help operators understand how hard they are hitting the flares and how many compressors the FGR console operators have running).

### Immediate steps taken to limit the duration and/or quantity of excess emissions:

The Flare Gas Recovery unit was operating and recovering as much excess gas as possible.

Applicable air operating permit term(s): 4.11

|  |                                  |                          |
|--|----------------------------------|--------------------------|
| Estimated Excess Emissions:<br><br>Based on SO <sub>2</sub> CEMS and calculated stack flow | Pollutant(s):<br>SO <sub>2</sub> | Pounds (Estimate):<br>25 |
|--|----------------------------------|--------------------------|

The incident was the result of the following (check all that apply):

- ☐ Scheduled equipment startup
- ☐ Scheduled equipment shutdown
- ☐ Poor or inadequate design
- ☐ Careless, poor, or inadequate operation
- ☐ Poor or inadequate maintenance
- ☐ A reasonably preventable condition

Did the facility receive any complaints from the public?

- ☒ No
- ☐ Yes (provide details below)

Did the incident result in the violation of an ambient air quality standard

- ☒ No
- ☐ Yes (provide details below)

Root and other contributing causes of incident:

The root cause of the incident was a malfunction of the compressor second stage knock-out drum level instrument (15LC308). The level indicator falsely read low while the liquid level increased. The compressor tripped on high liquid levels. A piping leak prevented immediate compressor restart.

The root cause of the incident was:

*(The retention of records of all required monitoring data and support information shall be kept for a period of five years from the date of the report as per the WAC regulation (173-401-615))*

- ☒ Identified for the first time
- ☐ Identified as a recurrence (explain previous incident(s) below – provide dates)

Are the emissions from the incident exempted by the NSPS or NESHAP "malfunction" definitions below?

- ☐ No
- ☒ Yes (describe below)

The root cause of the incident was a malfunction of the compressor second stage knock-out drum level (15LC308) instrument. The level indicator falsely read low while the liquid level increased. The compressor tripped on high liquid levels. A piping leak prevented immediate compressor restart.

Definition of NSPS "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or failure of a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 60.2

Definition of NESHAP "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 63.2

Analyses of measures available to reduce likelihood of recurrence (evaluate possible design, operational, and maintenance changes; discuss alternatives, probable effectiveness, and cost; determine if an outside consultant should be retained to assist with analyses):

Recommendations to avoid a reoccurrence of excess flaring while K100 is down for repairs are:

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2. FGR console operator is to begin cycling up to 4 compressor and monitor the kickback valve and Flare line pressures.



3. Once FGR compressors are cycled up, DCU may begin to slowly open up to the flare for venting during the blowdown drum process.
4. Operations Console operators should all monitor the following tags to help keep the venting under control: 19SO2FLAMEDRYPCT7, 15FI424.PV, 19FGRCMPRCOUNT and 19PC281.PV (These tags will help operators understand how hard they are hitting the flares and how many compressors the FGR console operators have running).

Description of corrective action to be taken (include commencement and completion dates):

See above

If correction not required, explain basis for conclusion:

See above

*Attach Reports, Reference Documents, and Other Backup Material as Necessary. This report satisfies the requirements of both NWCAA regulation 340, 341, 342 and the WAC regulation (173-400-107).*

Is the investigation continuing?

☒ No ☐ Yes

Is the source requesting additional time for completion of the report? ☒ No ☐ Yes

*Based upon information and belief formed after reasonable inquiry, I certify that the statements and information in this document and all referenced documents and attachments are true, accurate and complete.*

Prepared By: Jason Smolsnik Date: July 20, 2010

Responsible Official or Designee:  Date: 8/5/10